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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,080	06/25/2003	Walid Khairy Mohamed Ahmed	TYCO-0084 (50919)	4268
74701 7590 03/08/2010 ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST 255 S ORANGE AVENUE SUITE 1401 ORLANDO, FL 32801				
EXAMINER AHN, SAM K				
ART UNIT 2611		PAPER NUMBER		
NOTIFICATION DATE 03/08/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

creganoa@addmg.com

**Office Action Summary****Application No.**

10/606,080

**Applicant(s)**AHMED, WALID KHAIRY  
MOHAMED**Examiner**

SAM K. AHN

**Art Unit**

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 9-19 and 21-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-48 is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-19 and 49-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see p.16-18, filed 12/08/09 with respect to the rejection(s) of claim(s) 1-4,9-19 and 49-53 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bengtsson et al. US 2002/0071497 A1 (Bengtsson) in view of Nielsen US 6,987,954 B2.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 9-19,49, 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bengtsson et al. US 2002/0071497 A1 (Bengtsson) in view of Nielsen US 6,987,954 B2.

Regarding claim 1, Bengtsson teaches a method for electromagnetic processing of an input wave comprising the steps of: receiving a modified signal derived from two or more signals that represent said input wave when combined (output of 420 in Fig.9 wherein one skilled in the art would recognize that I and Q received by 410 are in phase and quadrature signals well-known to represent an input wave modified to be a modified signal). Bengtsson also teaches regulating said modified signal using

a plurality of segments and a digital signal containing at least one characteristic of said two or more signals (regulating said output of element 420 using plurality of PA drivers 1150a and 1150b and a digital signal of output of 440" having characteristics of the I and Q); wherein one or more of said segments is independently controlled as a power amplifier (PA or power amplifier 1150a and 1150b) by a portion of said two or more signals that represent said input wave to contribute power to an output signal (portion of output of 420 provided to 1150a and 1150b). Bengtsson further teaches a step of generating the output signal by combining power outputted from one or more of said segments (980 in Fig.12, generating output of 950a and 950b by combined power control outputted from one of said segment 950a). However, Bengtsson does not explicitly teach regulating said modified signal across one segment using a digital signal containing a characteristic of one of said two or more signals, and regulating said modified signal across another of said segments using another digital signal containing a characteristic of another of said two or more signals. Nielsen teaches regulating said modified signal across one segment using a digital signal containing a characteristic of one of said two or more signals (regulating or compensating at 406 in Fig. 7, bicomp, containing a characteristic of I or inphase), and regulating said modified signal across another of said segments using another digital signal containing a characteristic of another of said two or more signals (regulating or compensating at 408 in Fig. 7, bicomp, containing a characteristic of Q or quadrature). Nielsen further teaches wherein the I and Q baseband signals are compensated for the measured signal impairment by

predistorting (note c.1, I.57-62). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Nielsen in the system of Bengtsson of predistorting the signal prior to transmission for the purpose of compensating for the measured signal impairment by predistorting.

Regarding claim 2, Bengtsson further teaches wherein said two or more signals are in quadrature with each other (I and Q inputted to 420 are in phase and quadrature that are well-known to be in quadrature with each other).

Regarding claim 3, Bengtsson further teaches wherein said characteristic used to regulate said modified signal is magnitude (440" in Fig.9 regulate said modified is magnitude or amplitude by the amplitude tracking).

Regarding claim 4, Bengtsson further teaches a step of generating the output signal from said regulating of said modified signal (generating output signal, output of 1150a in Fig.9).

Regarding claim 9, Bengtsson in view of Kornfeld teaches all subject matter claimed, as applied to claim 1. And although Bengtsson does not explicitly teach wherein one or more of said segments is independently controlled as a current source by said portion of said two or more signals that represent said input wave to contribute current to an the output signal, at the time of the invention, it would have been

obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that such implementation provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the disclosure of Bengtsson of providing output signal because the power amplifier of Bengtsson properly generates output signal for wireless communication (note paragraph 0005). It is well-known that voltage source or current source can be implemented in generation of output signal. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Bengtsson to obtain the invention as specified in the claim.

Regarding claim 10, Bengtsson teaches all subject matter claimed, as applied to claim 1. However, Bengtsson does not teach wherein said received modified signal contains only one of said two or more signals used to derive said modified signal.

Kornfeld teaches said received modified signal (input signal in Fig.4 modified into modified signal provided to gain or power amplifiers F1 – F4) contains only one of said two or more signals used to derive said modified signal (each of the F1 – F4 receiving signal which contains only one of the four modified signals input to F1 – F4). Kornfeld further teaches that this implementation improves efficiency while maintaining linearity (note c.2, l.30-32). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Kornfeld in the system of Bengtsson for the purpose of improving efficiency while maintaining linearity (note c.2, l.30-32).

Regarding claim 11, Bengtsson further teaches wherein said received modified signal is derived from a sign characteristic of at least one of said two or more signals that represent said input wave when combined (received modified signal output by 420 having sign of positive or negative sign).

Regarding claim 12, Bengtsson further teaches wherein said modified signal is a carrier wave modulated by a characteristic of at least one of said two or more signals that represent said input wave when combined (carrier wave signal modulated through 1142a and 1142b).

Regarding claim 13, Bengtsson further teaches generating said modified signal (output of 420 in Fig.9).

Regarding claim 14, Kornfeld further teaches wherein said step of generating said modified signal comprises phase shifting a carrier wave to generate a phase shifted carrier wave (phase shifting input signal to provide 0 and 90), mixing a characteristic of one of said two or more signals that represent said input wave when combined with said carrier wave (mixing with a characteristic by element 98), and mixing a characteristic of another of said two or more signals that represent said input wave when combined with said phase shifted carrier wave (mixing with another characteristic by element 102).

Regarding claim 15, Kornfeld further teaches wherein said carrier wave and said phase shifted carrier wave have a relative phase difference of  $90^\circ$  (see 94 in Fig.4 providing signals with 90 degrees difference).

Regarding claim 16, Bengtsson further teaches generating said two or more signals that represent said input wave when combined (output of 420 in Fig.9).

Regarding claim 17, Bengtsson further teaches processing one or more of said two or more signals that represent said input wave when combined (output of 420 processed in Fig.9).

Regarding claim 18, Bengtsson further teaches performing correction of an amplitude characteristic of a carrier wave used in said derivation of said modified signal (amplitude correction through 440''').

Regarding claim 19, Bengtsson further teaches wherein said electromagnetic processing of said input wave comprises radio frequency modulation (note RF in paragraph 0003 modulated, note paragraph 0006).

Regarding claim 49, Bengtsson and Nielsen further teaches wherein the device comprises a power amplifier (460 in Fig.8), and wherein the at least two segments



comprise at least two amplifier segments (amplifier segments or VGA/PA drivers 1150a and 1150b in Fig.9 including the impairment compensation 112 interpreted herein as the at least two segments).

Regarding claim 50, Bengtsson and Nielsen further teaches wherein at least one of said amplifier segments is independently controlled as a power amplifier by a portion of said two or more signals that represent said input wave to contribute power to an output signal (1150a or 1150b controlled as power amplifier by 432a or 432b being, independent of each other, to contribute power to output signal output of 1150a or 1150b).

Regarding claim 53, Bengtsson in view of Nielsen teaches all subject matter claimed, as applied to claim 1 and teaches wherein the at least two segments comprise at least two amplifier segments (amplifier segments or VGA/PA drivers 1150a and 1150b in Fig.9 including the impairment compensation 112 interpreted herein as the at least two segments), Bengtsson in view of Nielsen does not explicitly teach wherein one or more of said segments is independently controlled as a current source by said portion of said two or more signals that represent said input wave to contribute current to an the output signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that such implementation provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in

the art, furthermore, would have expected Applicant's invention to perform equally well with the disclosure of Bengtsson of providing output signal because the power amplifier of Bengtsson properly generates output signal for wireless communication (note paragraph 0005). It is well-known that voltage source or current source can be implemented in generation of output signal. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Bengtsson to obtain the invention as specified in the claim.

3. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bengtsson et al. US 2002/0071497 A1 (Bengtsson) in view of Nielsen US 6,987,954 B2 And Kornfeld et al. US 5,974,041.

Regarding claim 51, Bengtsson in view of Nielsen teaches all subject matter claimed, as applied to claim 50, however, does not explicitly teach generating the output signal by combining power outputted from one or more of said segments using one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks. Kornfeld teach generating the output signal by combining power outputted from one or more of said segments using one or more selected from the group consisting of power transformers, quarter-wave transmission lines, discrete LC components, and a Pi-networks (see 106, 110 in Fig.4 and wherein quadrature phase combiners are interpreted herein as quarter-wave transmission lines, note c.6, I.39-47). Kornfeld further suggests that the system of the amplifier circuit improves efficiency while

maintaining efficiency (note c.2, I.29-32). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the amplifier circuit of Kornfeld in the system of Bengtsson for the purpose of improving efficiency while maintaining efficiency (note c.2, I.29-32).

Regarding claim 52, Bengtsson further teaches a step of generating the output signal by combining power outputted from one or more of said segments (980 in Fig.12, generating output of 950a and 950b by combined power control outputted from one of said segment 950a).

#### ***Allowable Subject Matter***

4. Claims 21-48 are allowed.

#### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory

period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sam K. Ahn/  
Primary Examiner, Art Unit 2611

3/4/2010